

product 56, follow the upward leading edge of the product belt 14 as it moves through chamber 42 by friction to create a rolling and tumbling action within the chamber 42. Thus, once completely formed, each tumble chamber 42 will continue to have the product conveyor belt 14 moving through it at a faster speed than the movement of the carrier conveyor 35, so the coating material 54 and pieces of food product 56 contained in the tumble chamber 42 will continue to be tumbled in the coating material 54 contained in the tumble chamber 42. Since the number of pieces in any individual tumble chamber may be controlled by selecting belt speed and feed speed of the products, the products will not be lifted far before they tumble within the chamber 42, so as to minimize the damage done to individual food product pieces both from interaction with other pieces and with the tumble chamber itself.

Similarly, the rollers 40 could be moved through zone 18 at a speed which is faster than the speed of conveyor 14 to cause relative movement between pocket 52 and belt 14 in an opposite direction to that shown in FIG. 6, wherein a similar coating and tumbling action would occur in the chambers 42, but on the opposite side of the chamber 42. In this embodiment, the unmaking of the pockets 52 may require that the elevation of the belt 14 be lowered to accommodate the differential speed between the conveyor 35 and belt 14, so that the pocket is unmade slowly as it is released from conveyor 35 and drops to a point below sprocket 38. The discharge from the machine may then be from this lower position or the conveyor 14 could be directed upwardly to again be at the same height as the inlet for example.

It is also a feature of the invention that the rollers 40 could be rotatably driven by means of chain 36 in conjunction with movement along zone 18 by means of conveyor system 35. In this embodiment, the rollers 40 may be rotatably driven at a faster or slower speed, and will function to drag the product conveyor 14 through the formed pockets 52 causing a tumbling action therein. This arrangement would allow flexibility in operating the machine in alternative modes for different applications or to achieve different coating characteristics.

Although the invention has been described with reference to a particular preferred embodiment thereof, it should be recognized that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. An apparatus for tumble coating of products comprising,
  - a housing defining a product conveyor path and having a product conveyor for conveying products along the conveyor path provided therein, said housing having an input end and a discharge end;
  - a carrier conveyor provided along said product conveyor path and a pocket forming mechanism which in conjunction with said carrier conveyor and said product conveyor forms at least one tumble chamber along said conveyor path in said product conveyor,
  - a coating supply to supply a charge of coating material at least to said at least one tumble chamber, wherein said at least one tumble chamber receives and carries said products positioned on said product conveyor in a processing zone as said product conveyor travels between said input and discharge ends wherein said coating material coats said products.
2. The tumble coating apparatus of claim 1, wherein said product conveyor is a conveyor belt supported within said

housing and including a drive mechanism for driving said conveyor belt from said input end to said discharge end thereof.

3. The tumble coating apparatus of claim 1, wherein, said pocket forming mechanism includes at least a pair of spaced apart support rollers and said at least one tumble chamber is formed by a portion of said product conveyor sagging between said pair of support rollers.
4. The tumble coating apparatus of claim 1, wherein, said pocket forming mechanism includes a plurality of support rollers having opposed ends which are carried by support members, said rollers engaging said product conveyor and being moved along said conveyor path by said support members.
5. The tumble coating apparatus of claim 4, wherein, said rollers rotate in a reverse direction to said movement along said conveyor path, with the speed at which said rollers are moved along said conveyor path being substantially the same as the speed of rotation of said rollers, wherein the reverse rotation of said rollers forms said at least one tumbling chamber.
6. The tumble coating apparatus of claim 4, wherein, said rollers rotate along with movement along said conveyor path, with the speed at which said rollers are moved along said conveyor path being slower than the speed of rotation of said rollers, wherein the differential rotation of said rollers causes said product conveyor to move relative to said at least one chamber.
7. The tumble coating apparatus of claim 4, wherein, said rollers rotate along with movement along said conveyor path, with the speed at which said rollers are moved along said conveyor path being faster than the speed of rotation of said rollers, wherein the differential rotation of said rollers causes said product conveyor to move relative to said at least one chamber.
8. The tumble coating apparatus of claim 4, wherein said plurality of rollers are rotatably driven as they are moved along said conveyor path.
9. The tumble coating apparatus of claim 1, wherein said carrier conveyor includes a plurality of support rollers driven by said carrier conveyor which engage said product conveyor and form said at least one tumble chamber in said product conveyor between an adjacent pair of said support rollers.
10. The tumble coating apparatus of claim 1, wherein a plurality of said tumble chambers are formed along said product conveyor path in a processing zone, wherein said products are continuously moved around within each of said chambers within said processing zone for coating thereof.
11. The tumble coating apparatus of claim 1, wherein said carrier conveyor comprises a pair of spaced apart closed chain members which carry a plurality of support rollers therebetween, said rollers being spaced apart at predetermined intervals along said conveyor path wherein a plurality of said chambers are formed between pairs of said support rollers.
12. The tumble coating apparatus of claim 1, wherein said product conveyor is made of a previous material.
13. The tumble coating apparatus of claim 1, wherein said carrier conveyor includes means associated with said at least one tumble chamber to catch and move coating material along said conveyor path as said product conveyor moves along said path.
14. An apparatus for coating of products comprising,
  - a housing defining a product conveyor path and having a product conveyor for conveying products along the